

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

RUUSKANEN, Juha-Pekka
Page White & Farrer
54 Doughty Street
London WC1N 2LS
ROYAUME-UNI

Date of mailing (day/month/year) 15 January 2002 (15.01.02)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference 102944/JPR	
International application No. PCT/EP00/09206	International filing date (day/month/year) 19 September 2000 (19.09.00)

1. The following indications appeared on record concerning:

☒ the applicant
 ☐ the inventor
 ☐ the agent
 ☐ the common representative

Name and Address NOKIA NETWORKS OY Keilalahdentie 4 FIN-02150 Espoo Finland	State of Nationality FI	State of Residence FI
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☐ the person
 ☒ the name
 ☐ the address
 ☐ the nationality
 ☐ the residence

Name and Address NOKIA CORPORATION Keilalahdentie 4 FIN-02150 Espoo Finland	State of Nationality FI	State of Residence FI
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

<input checked="" type="checkbox"/> the receiving Office	<input type="checkbox"/> the designated Offices concerned
<input type="checkbox"/> the International Searching Authority	<input checked="" type="checkbox"/> the elected Offices concerned
<input checked="" type="checkbox"/> the International Preliminary Examining Authority	<input type="checkbox"/> other:

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Beate GIFFO-SCHMITT Telephone No.: (41-22) 338.83.38
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PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner
 US Department of Commerce
 United States Patent and Trademark
 Office, PCT
 2011 South Clark Place Room
 CP2/5C24
 Arlington, VA 22202
 ETATS-UNIS D'AMERIQUE
 in its capacity as elected Office

Date of mailing (day/month/year) 29 May 2001 (29.05.01)	
International application No. PCT/EP00/09206	Applicant's or agent's file reference 102944/JPR
International filing date (day/month/year) 19 September 2000 (19.09.00)	Priority date (day/month/year) 20 September 1999 (20.09.99)
Applicant PEKONEN, Johanna et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:
 21 February 2001 (21.02.01)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Claudio Borton Telephone No.: (41-22) 338.83.38
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PATENT COOPERATION TREATY

PCT

NOTICE INFORMING THE APPLICANT OF THE COMMUNICATION OF THE INTERNATIONAL APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

From the INTERNATIONAL BUREAU

To:
RUUSKANEN, Juha-Pekka
Page White & Farrer
54 Doughty Street
London WC1N 2LS
ROYAUME-UNI

RECEIVED
- 9 APR 2001
Ans'd.....

Date of mailing (day/month/year) 29 March 2001 (29.03.01)		
Applicant's or agent's file reference 102944/JPR		IMPORTANT NOTICE
International application No. PCT/EP00/09206	International filing date (day/month/year) 19 September 2000 (19.09.00)	Priority date (day/month/year) 20 September 1999 (20.09.99)
Applicant NOKIA NETWORKS OY et al		

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:

AU, KP, KR, US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:

AE, AG, AL, AM, AP, AT, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EA, EE, EP, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OA, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU,
The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on 29 March 2001 (29.03.01) under No. WO 01/22759

REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a demand for international preliminary examination must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the national phase, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer J. Zahra
Facsimile No. (41-22) 740.14.35	Telephone No. (41-22) 338.83.38

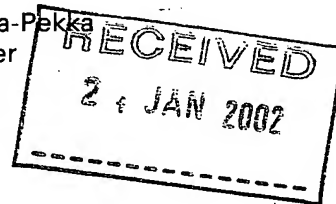
PATENT COOPERATION TREATY

PCT

NOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

RUUSKANEN, Juha-Pekka
Page White & Farrer
54 Doughty Street
London WC1N 2LS
ROYAUME-UNI

Date of mailing (day/month/year) 15 January 2002 (15.01.02)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference 102944/JPR	
International application No. PCT/EP00/09206	
International filing date (day/month/year) 19 September 2000 (19.09.00)	

1. The following indications appeared on record concerning:

☒ the applicant ☐ the inventor ☐ the agent ☐ the common representative

Name and Address NOKIA NETWORKS OY Keilalahdentie 4 FIN-02150 Espoo Finland	State of Nationality FI	State of Residence FI
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☐ the person ☒ the name ☐ the address ☐ the nationality ☐ the residence

Name and Address NOKIA CORPORATION Keilalahdentie 4 FIN-02150 Espoo Finland	State of Nationality FI	State of Residence FI
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

<input checked="" type="checkbox"/> the receiving Office	<input type="checkbox"/> the designated Offices concerned
<input type="checkbox"/> the International Searching Authority	<input checked="" type="checkbox"/> the elected Offices concerned
<input checked="" type="checkbox"/> the International Preliminary Examining Authority	<input type="checkbox"/> other:

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Beate GIFFO-SCHMITT Telephone No.: (41-22) 338.83.38
--	--

COPY

PCT

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference

(if desired) (12 characters maximum) 102944/JPR

Box No. I TITLE OF INVENTION

REPORTING IN A CELLULAR COMMUNICATION SYSTEM

Box No. II APPLICANT

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

Nokia Networks Oy
Keilalahdentie 4
FIN-02150 ESPOO
Finland

☐ This person is also inventor.

Telephone No.

Facsimile No.

Teleprinter No.

State (that is, country) of nationality:

Finland

State (that is, country) of residence:

Finland

This person is applicant for the purposes of:

☐ all designated States☒ all designated States except the United States of America☐ the United States of America only☐ the States indicated in the Supplemental Box

Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

PEKONEN, Johanna
Otsolahdentie 7 D 45
FIN-02110 Espoo
Finland

This person is:

☐ applicant only☒ applicant and inventor☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

Finland

State (that is, country) of residence:

Finland

This person is applicant for the purposes of:

☐ all designated States☐ all designated States except the United States of America☒ the United States of America only☐ the States indicated in the Supplemental Box☐ Further applicants and/or (further) inventors are indicated on a continuation sheet.

Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:

☒ agent☐ common representative

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

RUUSKANEN, Juha-Pekka
PAGE WHITE & FARRER
54 Doughty Street
London WC1N 2LS
United Kingdom

Telephone No.

020 7831-7929

Facsimile No.

020 7831-8040

Teleprinter No.

8955681

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Continuation of Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)	
<i>If none of the following sub-boxes is used, this sheet should not be included in the request.</i>	
<p>Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)</i></p> <p>FRIMAN, Leif Satakunnanpolku 34 FIN-044000 Järvenpää Finland</p>	<p>This person is:</p> <p><input type="checkbox"/> applicant only</p> <p><input checked="" type="checkbox"/> applicant and inventor</p> <p><input type="checkbox"/> inventor only <i>(If this check-box is marked, do not fill in below.)</i></p>
State <i>(that is, country)</i> of nationality: Finland	State <i>(that is, country)</i> of residence: Finland
<p>This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input checked="" type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box</p>	
<p>Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)</i></p> <p>JOKINEN, Harri Vähähiidentie 450 FIN-25370 Finland</p>	<p>This person is:</p> <p><input type="checkbox"/> applicant only</p> <p><input checked="" type="checkbox"/> applicant and inventor</p> <p><input type="checkbox"/> inventor only <i>(If this check-box is marked, do not fill in below.)</i></p>
State <i>(that is, country)</i> of nationality:	State <i>(that is, country)</i> of residence:
<p>This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input checked="" type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box</p>	
<p>Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)</i></p>	<p>This person is:</p> <p><input type="checkbox"/> applicant only</p> <p><input type="checkbox"/> applicant and inventor</p> <p><input type="checkbox"/> inventor only <i>(If this check-box is marked, do not fill in below.)</i></p>
State <i>(that is, country)</i> of nationality:	State <i>(that is, country)</i> of residence:
<p>This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box</p>	
<p>Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)</i></p>	<p>This person is:</p> <p><input type="checkbox"/> applicant only</p> <p><input type="checkbox"/> applicant and inventor</p> <p><input type="checkbox"/> inventor only <i>(If this check-box is marked, do not fill in below.)</i></p>
State <i>(that is, country)</i> of nationality:	State <i>(that is, country)</i> of residence:
<p>This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box</p>	
<p><input type="checkbox"/> Further applicants and/or (further) inventors are indicated on another continuation sheet.</p>	

Box No.V DESIGNATION OF STATES

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes; at least one must be marked):

Regional Patent

- ☒ **AP ARIPO Patent:** GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, MZ Mozambique, SD Sudan, SL Sierra Leone, SZ Swaziland, TZ United Republic of Tanzania, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☒ **EA Eurasian Patent:** AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ **EP European Patent:** AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☒ **OA OAPI Patent:** BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line)

National Patent (if other kind of protection or treatment desired, specify on dotted line):

- | | |
|---|---|
| <input checked="" type="checkbox"/> AE United Arab Emirates | <input checked="" type="checkbox"/> LC Saint Lucia |
| <input checked="" type="checkbox"/> AG Antigua and Barbuda | <input checked="" type="checkbox"/> LK Sri Lanka |
| <input checked="" type="checkbox"/> AL Albania | <input checked="" type="checkbox"/> LR Liberia |
| <input checked="" type="checkbox"/> AM Armenia | <input checked="" type="checkbox"/> LS Lesotho |
| <input checked="" type="checkbox"/> AT Austria | <input checked="" type="checkbox"/> LT Lithuania |
| <input checked="" type="checkbox"/> AU Australia | <input checked="" type="checkbox"/> LU Luxembourg |
| <input checked="" type="checkbox"/> AZ Azerbaijan | <input checked="" type="checkbox"/> LV Latvia |
| <input checked="" type="checkbox"/> BA Bosnia and Herzegovina | <input checked="" type="checkbox"/> MA Morocco |
| <input checked="" type="checkbox"/> BB Barbados | <input checked="" type="checkbox"/> MD Republic of Moldova |
| <input checked="" type="checkbox"/> BG Bulgaria | <input checked="" type="checkbox"/> MG Madagascar |
| <input checked="" type="checkbox"/> BR Brazil | <input checked="" type="checkbox"/> MK The former Yugoslav Republic of Macedonia |
| <input checked="" type="checkbox"/> BY Belarus | <input checked="" type="checkbox"/> MN Mongolia |
| <input checked="" type="checkbox"/> BZ Belize | <input checked="" type="checkbox"/> MW Malawi |
| <input checked="" type="checkbox"/> CA Canada | <input checked="" type="checkbox"/> MX Mexico |
| <input checked="" type="checkbox"/> CH and LI Switzerland and Liechtenstein | <input checked="" type="checkbox"/> MZ Mozambique |
| <input checked="" type="checkbox"/> CN China | <input checked="" type="checkbox"/> NO Norway |
| <input checked="" type="checkbox"/> CR Costa Rica | <input checked="" type="checkbox"/> NZ New Zealand |
| <input checked="" type="checkbox"/> CU Cuba | <input checked="" type="checkbox"/> PL Poland |
| <input checked="" type="checkbox"/> CZ Czech Republic | <input checked="" type="checkbox"/> PT Portugal |
| <input checked="" type="checkbox"/> DE Germany | <input checked="" type="checkbox"/> RO Romania |
| <input checked="" type="checkbox"/> DK Denmark | <input checked="" type="checkbox"/> RU Russian Federation |
| <input checked="" type="checkbox"/> DM Dominica | <input checked="" type="checkbox"/> SD Sudan |
| <input checked="" type="checkbox"/> DZ Algeria | <input checked="" type="checkbox"/> SE Sweden |
| <input checked="" type="checkbox"/> EE Estonia | <input checked="" type="checkbox"/> SG Singapore |
| <input checked="" type="checkbox"/> ES Spain | <input checked="" type="checkbox"/> SI Slovenia |
| <input checked="" type="checkbox"/> FI Finland | <input checked="" type="checkbox"/> SK Slovakia |
| <input checked="" type="checkbox"/> GB United Kingdom | <input checked="" type="checkbox"/> SL Sierra Leone |
| <input checked="" type="checkbox"/> GD Grenada | <input checked="" type="checkbox"/> TJ Tajikistan |
| <input checked="" type="checkbox"/> GE Georgia | <input checked="" type="checkbox"/> TM Turkmenistan |
| <input checked="" type="checkbox"/> GH Ghana | <input checked="" type="checkbox"/> TR Turkey |
| <input checked="" type="checkbox"/> GM Gambia | <input checked="" type="checkbox"/> TT Trinidad and Tobago |
| <input checked="" type="checkbox"/> HR Croatia | <input checked="" type="checkbox"/> TZ United Republic of Tanzania |
| <input checked="" type="checkbox"/> HU Hungary | <input checked="" type="checkbox"/> UA Ukraine |
| <input checked="" type="checkbox"/> ID Indonesia | <input checked="" type="checkbox"/> UG Uganda |
| <input checked="" type="checkbox"/> IL Israel | <input checked="" type="checkbox"/> US United States of America |
| <input checked="" type="checkbox"/> IN India | <input checked="" type="checkbox"/> UZ Uzbekistan |
| <input checked="" type="checkbox"/> IS Iceland | <input checked="" type="checkbox"/> VN Viet Nam |
| <input checked="" type="checkbox"/> JP Japan | <input checked="" type="checkbox"/> YU Yugoslavia |
| <input checked="" type="checkbox"/> KE Kenya | <input checked="" type="checkbox"/> ZA South Africa |
| <input checked="" type="checkbox"/> KG Kyrgyzstan | <input checked="" type="checkbox"/> ZW Zimbabwe |
| <input checked="" type="checkbox"/> KP Democratic People's Republic of Korea | |
| <input checked="" type="checkbox"/> KR Republic of Korea | |
| <input checked="" type="checkbox"/> KZ Kazakhstan | |

Check-box reserved for designating States which have become party to the PCT after issuance of this sheet:

Precautionary Designation Statement: In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation (including fees) must reach the receiving Office within the 15-month time limit.)

Supplemental Box

If the Supplemental Box is not used, this sheet should not be included in the request.

1. If, in any of the Boxes, the space is insufficient to furnish all the information, in such case, write "Continuation of Box No. [indicate the number of the Box]" and furnish the information in the same manner as required according to the captions of the Box in which the space was insufficient, in particular:

- (i) if more than two persons are involved as applicants and/or inventors and no "continuation sheet" is available: in such case, write "Continuation of Box No. III" and indicate for each additional person the same type of information as required in Box No. III. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below;
- (ii) if, in Box No. II or in any of the sub-boxes of Box No. III, the indication "the States indicated in the Supplemental Box" is checked: in such case, write "Continuation of Box No. II" or "Continuation of Box No. III" or "Continuation of Boxes No. II and No. III" (as the case may be), indicate the name of the applicant(s) involved and, next to (each) such name, the State(s) (and/or, where applicable, ARIPO, Eurasian, European or OAPI patent) for the purposes of which the named person is applicant;
- (iii) if, in Box No. II or in any of the sub-boxes of Box No. III, the inventor or the inventor/applicant is not inventor for the purposes of all designated States or for the purposes of the United States of America: in such case, write "Continuation of Box No. II" or "Continuation of Box No. III" or "Continuation of Boxes No. II and No. III" (as the case may be), indicate the name of the inventor(s) and, next to (each) such name, the State(s) (and/or, where applicable, ARIPO, Eurasian, European or OAPI patent) for the purposes of which the named person is inventor;
- (iv) if, in addition to the agent(s) indicated in Box No. IV, there are further agents: in such case, write "Continuation of Box No. IV" and indicate for each further agent the same type of information as required in Box No. IV;
- (v) if, in Box No. V, the name of any State (or OAPI) is accompanied by the indication "patent of addition," or "certificate of addition," or if, in Box No. V, the name of the United States of America is accompanied by an indication "continuation" or "continuation-in-part": in such case, write "Continuation of Box No. V" and the name of each State involved (or OAPI), and after the name of each such State (or OAPI), the number of the parent title or parent application and the date of grant of the parent title or filing of the parent application;
- (vi) if, in Box No. VI, there are more than three earlier applications whose priority is claimed: in such case, write "Continuation of Box No. VI" and indicate for each additional earlier application the same type of information as required in Box No. VI;
- (vii) if, in Box No. VI, the earlier application is an ARIPO application: in such case, write "Continuation of Box No. VI", specify the number of the item corresponding to that earlier application and indicate at least one country party to the Paris Convention for the Protection of Industrial Property or one Member of the World Trade Organization for which that earlier application was filed.

2. If, with regard to the precautionary designation statement contained in Box No. I, the applicant wishes to exclude any State(s) from the scope of that statement: in such case, write "Designation(s) excluded from precautionary designation statement" and indicate the name or two-letter code of each State so excluded.

3. If the applicant claims, in respect of any designated Office, the benefits of provisions of the national law concerning non-prejudicial disclosures or exceptions to lack of novelty: in such case, write "Statement concerning non-prejudicial disclosures or exceptions to lack of novelty" and furnish that statement below.

Continuation of Box IV

Agents continues

PALMER, Roger (GB)
 RICHARDS, David John (GB)
 PENDLEBURY, Anthony (GB)
 JENKINS, Peter David (GB)
 DRIVER, Virginia Rozanne (GB)
 DANIELS, Jeffery Nicholas (GB)
 NEOBARD, William John (GB)
 SHACKLETON, Nicola (GB)
 SLINGSBY, Philip Roy (GB)
 HILL, Christopher Michael (GB)
 RUUSKANEN, Juha-Pekka (FI)
 WILLIAMS, David John (GB)

All of:

PAGE WHITE & FARRER
 54 Doughty Street
 London WC1N 2LS
 United Kingdom

Box No. VI. PRIORITY CLAIM					<input type="checkbox"/> Further priority claims are indicated in the Supplemental Box.
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:			
		national application: country	regional application: regional Office	international application: receiving Office	
item (1) 20 September 1999	9922217.6	GB			
item (2)					
item (3)					
<input type="checkbox"/> The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s):					
<i>* Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.</i>					
Box No. VII INTERNATIONAL SEARCHING AUTHORITY					
Choice of International Searching Authority (ISA) (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):		Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority):			
ISA / EP		Date (day/month/year)	Number	Country (or regional Office)	
		17 May 2000	RS 103899	EP	
Box No. VIII CHECK LIST; LANGUAGE OF FILING					
This international application contains the following number of sheets: request : 5 description (excluding sequence listing part) : 20 claims : 6 abstract : 1 drawings : 3 sequence listing part of description : Total number of sheets : 35		This international application is accompanied by the item(s) marked below: 1. <input checked="" type="checkbox"/> fee calculation sheet 2. <input type="checkbox"/> separate signed power of attorney 3. <input checked="" type="checkbox"/> copy of general power of attorney, reference number, if any: 4. <input type="checkbox"/> statement explaining lack of signature 5. <input type="checkbox"/> priority document(s) identified in Box No. VI as item(s): 6. <input type="checkbox"/> translation of international application into (language): 7. <input type="checkbox"/> separate indications concerning deposited microorganism or other biological material 8. <input type="checkbox"/> nucleotide and/or amino acid sequence listing in computer readable form 9. <input type="checkbox"/> other (specify):			
Figure of the drawings which should accompany the abstract: 1		Language of filing of the international application: EN			
Box No. IX SIGNATURE OF APPLICANT OR AGENT					
Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).					
RUUSKANEN, Juha-Pekka.....(Agent)					

For receiving Office use only	
1. Date of actual receipt of the purported international application:	2. Drawings: <input type="checkbox"/> received: <input type="checkbox"/> not received:
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:	
4. Date of timely receipt of the required corrections under PCT Article 11(2):	
5. International Searching Authority (if two or more are competent): ISA /	
6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid.	

For International Bureau use only
Date of receipt of the record copy by the International Bureau:

COPY

The demand must be filed directly with the competent International Preliminary Examining Authority or, if two or more Authorities are competent, with the one chosen by the applicant. The full name or two-letter code of that Authority may be indicated by the applicant on the line below:

IPEA/ EPO

PCT

CHAPTER II

DEMAND

under Article 31 of the Patent Cooperation Treaty:

The undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty and hereby elects all eligible States (except where otherwise indicated).

For International Preliminary Examining Authority use only		
Identification of IPEA		Date of receipt of DEMAND
Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION		Applicant's or agent's file reference 102944/JPR
International application No. PCT/EP00/09206	International filing date (day/month/year) 19 September 2000	(Earliest) Priority date (day/month/year) 20 September 1999
Title of invention REPORTING IN A CELLULAR COMMUNICATION SYSTEM		
Box No. II APPLICANT(S)		
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) Nokia Networks Oy Keilalahdentie 4 FIN-02150 ESPOO Finland		Telephone No.: Facsimile No.: Teleprinter No.:
State (that is, country) of nationality: Finland (FI)	State (that is, country) of residence: Finland (FI)	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) PEKONEN, Johanna Otsolahdentie 7 D 45 FIN-02110 Espoo Finland		
State (that is, country) of nationality: Finland (FI)	State (that is, country) of residence: Finland (FI)	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) FRIMAN, Leif Satakunnanpolku 34 FIN-044000 Järvenpää Finland		
State (that is, country) of nationality: Finland (FI)	State (that is, country) of residence: Finland (FI)	
<input checked="" type="checkbox"/> Further applicants are indicated on a continuation sheet.		

Continuation of Box No. II APPLICANT(S)

If none of the following sub-boxes is used, this sheet should not be included in the demand.

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

JOKINEN, Harri
Vähähiidentie 450
FIN-25370 Hiisi
Finland

State (that is, country) of nationality:
Finland (FI)

State (that is, country) of residence:
Finland (FI)

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

State (that is, country) of nationality:

State (that is, country) of residence:

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

State (that is, country) of nationality:

State (that is, country) of residence:

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

State (that is, country) of nationality:

State (that is, country) of residence:

☐ Further applicants are indicated on another continuation sheet.

Box No. III AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The following person is ☒ agent ☐ common representative

and ☒ has been appointed earlier and represents the applicant(s) also for international preliminary examination.

☐ is hereby appointed and any earlier appointment of (an) agent(s)/common representative is hereby revoked.

☐ is hereby appointed, specifically for the procedure before the International Preliminary Examining Authority, in addition to the agent(s)/common representative appointed earlier.

Name and address: *(Family name followed by given name: for a legal entity, full official designation. The address must include postal code and name of country.)*

RUUSKANEN, Juha-Pekka
PAGE WHITE & FARRER
54 Doughty Street
London WC1N 2LS
United Kingdom

Telephone No.:

020 7831-7929

Facsimile No.:

020 7831-8040

Teleprinter No.:

8955681

☐ **Address for correspondence:** Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Box No. IV BASIS FOR INTERNATIONAL PRELIMINARY EXAMINATION

Statement concerning amendments:*

1. The applicant wishes the international preliminary examination to start on the basis of:

☒ the international application as originally filed

the description ☒ as originally filed

☐ as amended under Article 34

the claims ☒ as originally filed

☐ as amended under Article 19 (together with any accompanying statement)

☐ as amended under Article 34

the drawings ☒ as originally filed

☐ as amended under Article 34

2. ☐ The applicant wishes any amendment to the claims under Article 19 to be considered as reversed.

3. ☐ The applicant wishes the start of the international preliminary examination to be postponed until the expiration of 20 months from the priority date unless the International Preliminary Examining Authority receives a copy of any amendments made under Article 19 or a notice from the applicant that he does not wish to make such amendments (Rule 69.1(d)). *(This check-box may be marked only where the time limit under Article 19 has not yet expired.)*

* Where no check-box is marked, international preliminary examination will start on the basis of the international application as originally filed or, where a copy of amendments to the claims under Article 19 and/or amendments of the international application under Article 34 are received by the International Preliminary Examining Authority before it has begun to draw up a written opinion or the international preliminary examination report, as so amended.

Language for the purposes of international preliminary examination: EN

☒ which is the language in which the international application was filed.

☐ which is the language of a translation furnished for the purposes of international search.

☐ which is the language of publication of the international application.

☐ which is the language of the translation (to be) furnished for the purposes of international preliminary examination.

Box No. V ELECTION OF STATES

The applicant hereby elects all eligible States *(that is, all States which have been designated and which are bound by Chapter II of the PCT)*

excluding the following States which the applicant wishes not to elect:

Box No. VI CHECK LIST

The demand is accompanied by the following elements, in the language referred to in Box No. IV, for the purposes of international preliminary examination:

- | | | |
|--|---|----------|
| 1. translation of international application | : | sheets |
| 2. amendments under Article 34 | : | sheets |
| 3. copy (or, where required, translation) of amendments under Article 19 | : | sheets |
| 4. copy (or, where required, translation) of statement under Article 19 | : | sheets |
| 5. letter | : | 1 sheets |
| 6. other (<i>specify</i>) | : | sheets |

For International Preliminary
Examining Authority use only

received not received

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

The demand is also accompanied by the item(s) marked below:

- | | |
|--|---|
| 1. <input type="checkbox"/> fee calculation sheet | 4. <input type="checkbox"/> statement explaining lack of signature |
| 2. <input type="checkbox"/> separate signed power of attorney | 5. <input type="checkbox"/> nucleotide and or amino acid sequence listing in computer readable form |
| 3. <input type="checkbox"/> copy of general power of attorney; reference number, if any: | 6. <input type="checkbox"/> other (<i>specify</i>): |

Box No. VII SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the demand).

RUUSKANEN, Juha-Pekka.....(Agent)

For International Preliminary Examining Authority use only

1. Date of actual receipt of DEMAND:

2. Adjusted date of receipt of demand due to CORRECTIONS under Rule 60.1(b):

3. ☐ The date of receipt of the demand is AFTER the expiration of 19 months from the priority date and item 4 or 5, below, does not apply.

☐ The applicant has been informed accordingly.

4. ☐ The date of receipt of the demand is WITHIN the period of 19 months from the priority date as extended by virtue of Rule 80.5.

5. ☐ Although the date of receipt of the demand is after the expiration of 19 months from the priority date, the delay in arrival is EXCUSED pursuant to Rule 82.

For International Bureau use only

Demand received from IPEA on:



P. B. 5818 - Patentlaan 2
2280 HV Rijswijk (ZH)
+31 70 340 2040
TX 31651 epo.nl
FAX +31 70 340 3016

Europäische
Patentamt

Zweigstelle
in Den Haag

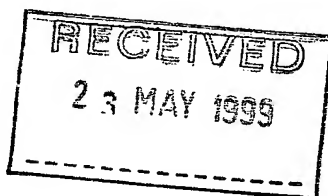
European
Patent Office

Branch at
The Hague

Office européen
des brevets

Département à
La Haye

PAGE WHITE & FARRER
Attn. Mr Juha-Pekka Ruuskanen
54 Doughty Street
LONDON WC1N 2LS
UNITED KINGDOM



Aktenzeichen/File No./No. du Dossier

RS 103899 GB

Datum/Date

22.05.2000

Das Europäische Patentamt übermittelt hiermit den Standardrecherchenbericht zu dem unten bezeichneten Antrag; Kopien der im Recherchenbericht angeführten Schriften werden in der Anlage beigelegt.

The European Patent Office herewith transmits the Standard Search Report relating to the request indicated below; copies of the documents cited in the search report are enclosed.

L'Office Européen des Brevets à l'honneur de vous transmettre ci-joint le Rapport de Recherche concernant la demande désignée ci-dessous; des copies des documents cités sont jointes.

Zeichen und Datum des Antrages Applicant's reference and date Références et date de la demande	100358/PRS/JPR/sjr
Dokument, Gegenstand der Recherche Document subject of the search Objet de la recherche	GBA 9922217
Einreichungstag Filing date Date de dépôt	20/09/1999
Beanspruchte Priorität Priority claimed Priorité revendiquée	

OFFICE EUROPÉEN DES BREVETS
Pour le Vice-Président,

REC'D 18 MAR 2002

WIPO PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

8

Applicant's or agent's file reference 102944/JPR		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/EP00/09206	International filing date (day/month/year) 19/09/2000	Priority date (day/month/year) 20/09/1999
International Patent Classification (IPC) or national classification and IPC H04Q7/38		
Applicant NOKIA CORPORATION		


- This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 6 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

- This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 21/02/2001	Date of completion of this report 14.03.2002
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Hodgins, W Telephone No. +49 89 2399 8987



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP00/09206

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-20 as originally filed

Claims, No.:

1-30 as originally filed

Drawings, sheets:

1/3-3/3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:
- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.
4. The amendments have resulted in the cancellation of:..
- ☐ the description, pages:
- ☐ the claims, Nos.:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP00/09206

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims 2,3,12,15,19,21-23,28
	No:	Claims 1,4-11,13,14,16-18,20,24-27,29,30
Inventive step (IS)	Yes:	Claims
	No:	Claims 2,3,12,15,19,21-23,28
Industrial applicability (IA)	Yes:	Claims 1-30
	No:	Claims

2. Citations and explanations
see separate sheet

Concerning Point V

- 1) The following documents are cited:
D1: WO 99 05878 A (ERICSSON TELEFON AB L M) 4 February 1999 (1999-02-04)
D2: US-A-5 594 949 (ANDERSSON CLAES H ET AL) 14 January 1997 (1997-01-14)
D3: GB-A-2 327 014 (ERICSSON TELEFON AB L M) 6 January 1999 (1999-01-06)
D4: EP-A-0 920 143 (ICO SERVICES LTD) 2 June 1999 (1999-06-02)
- 2) The applicant's arguments with respect to patentability have been carefully considered. It is noted that what the applicant feels central to the current invention is that a reporting order for cells is defined. From the description it is clear that what this means is that a report is to be sent for cell A, B, C etc. Pre-defining this order means that the cell id doesn't have to be sent and thus transmission capacity can be saved.

It is possible that this might form the basis of a patentable invention. However, the current claims are such that a broader interpretation of their meaning is possible. The interpretation put on the phrase "defining a reporting order" as used in the claims is that it could be defined that the largest signal measurement from a cell is sent first, then the second largest etc (or the other way round, or that some other signal parameter is used).
- 3) Viewed like this, the claimed invention is not novel over D1. D1 discloses a method in a cellular communication system for reporting cell measurement results associated with cells of the system from a transceiver station via a radio interface between the transceiver station and a cell serving the transceiver station (see abstract).

The method of D1 comprises:

defining a reporting order of the cells to be used by the transceiver station for reporting (the BA-list mentioned on page 16 lines 9 - 15 and transmitted to mobile station as shown in figure 6);

performing cell measurements at the transceiver station for getting cell measurement results associated with at least some of the cells (page 13 lines 10 - 16);
selecting relevant cell measurement results from the performed cell measurements (page 13 lines 17 - 23; the 6 strongest are selected); and
reporting the cell measurement results from the transceiver station in the defined reporting order (see figure 6 boxes 47 or 53 and related parts of description).

Interpreting the claim language as above, claim 1 is thus totally known from D1, and accordingly fails to meet the requirements of Articles 33(1) and (2) PCT.

- 4) Independent claim 20 relates for the apparatus category to method claim 1. Independent claims 27 and 30 are broader than claim 20, since they each relate to only a part of the system, namely respectively to a mobile station and a network node.

The comments made above thus apply to these claims also, which likewise fail to meet the requirements of Articles 33(1) and (3) PCT with respect to novelty.

- 5) For allowability, dependent claims pre-suppose an allowable independent claim. Since this is not currently the case, none of the dependent claims meet the requirements of Article 33(1) PCT with regard either to novelty (Article 33(2) PCT) or inventive step (Article 33(3) PCT) as indicated on the attached form.
- 6) The claimed invention is industrially applicable within the meaning of Articles 33(1) and (4) PCT.
- 7) For the sake of completeness, the following is noted:
- i) The independent claims should have been put in the two part form recommended by Rule 6.3(b) PCT with a pre-characterising part reflecting the teachings of the closest prior art.

- ii) In order to meet the requirements of Rule 6.2(b) PCT reference signs in parenthesis should have been added to the claims. This applies both to the pre-ambles and to the characterising part, and to method claims in as far as they refer to apparatus features.
- iii) In order to meet the requirements of Rule 5.1(a)(ii) PCT, at least a couple of the documents D1 - D4 should have been cited in the description and briefly discussed.
- iv) Independent claim 30 is unclear, contrary to the requirements of Article 6 PCT.

Firstly, the claim is partly defined in terms of the measurement results (which are produced in the mobile station not in the network node claimed) rather than in terms of the technical features of the network node itself (cf PCT Guidelines III 4.8).

Secondly, what is meant by "control means for defining the reporting order used by the station for the reporting and control means for attaching measurement results to cells based on the reporting order" in general and the "control means for attaching ..." in particular is not understood. It is also not apparent to what extent this phrase is supported by the description.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 102944/JPR	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/EP 00/09206	International filing date (day/month/year) 19/09/2000	(Earliest) Priority Date (day/month/year) 20/09/1999
Applicant NOKIA NETWORKS OY		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established by this Authority to read as follows:

REPORTING CELL MEASUREMENT RESULTS IN A CELLULAR COMMUNICATION SYSTEM

5. With regard to the **abstract**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☒ because this figure better characterizes the invention.

3

☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/EP 00/09206

Box III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

Change Line 2 to: "results associated with a plurality of cells of a cellular".
Change Line 4 to: "station via a radio interface to receiver element of a cell".

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04Q7/38 H04B17/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04Q H04B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EP0-Internal, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	WO 99 05878 A (ERICSSON TELEFON AB L M) 4 February 1999 (1999-02-04) abstract; figures 5,6 page 4, line 21 -page 6, last line page 7, line 9 -page 8, line 24 page 13, line 10 - last line page 16, line 9 - line 15 page 18, line 28 -page 20, line 24 --- -/--	1,4,5, 7-11,13, 14,16, 17,20, 24-27,29 2,3,6, 12, 21-23, 28,30

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents:

A document defining the general state of the art which is not considered to be of particular relevance

E earlier document but published on or after the international filing date

L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

O document referring to an oral disclosure, use, exhibition or other means

P document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

Z document member of the same patent family

Date of the actual completion of the international search

20 December 2000

Date of mailing of the international search report

25/01/2001

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Sieben, S

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	US 5 594 949 A (ANDERSSON CLAES H ET AL) 14 January 1997 (1997-01-14) column 3, line 55 -column 4, line 28 column 4, line 54 - line 64 column 5, line 28 - line 36 column 6, line 3 - line 14; figure 4 column 6, line 35 - line 50 -----	1, 4, 6-10, 18, 20, 24, 26, 27, 29 5, 12-14, 16, 25, 30
X A	GB 2 327 014 A (ERICSSON TELEFON AB L M) 6 January 1999 (1999-01-06) page 2, line 20 - line 22 page 5, line 20 - last line; figure 1 page 6, line 17 - line 22 page 6, line 31 -page 7, line 13 page 8, line 7 -page 9, line 10; figure 3 claim 1 -----	1, 4, 7-10, 20, 24, 26, 27, 29 5, 6, 12-14, 16, 25, 30
X A	EP 0 920 143 A (ICO SERVICES LTD) 2 June 1999 (1999-06-02) column 1, line 20 - line 30 column 4, line 39 -column 5, line 2 -----	1, 4, 7-10, 20, 24, 26, 27, 29 5, 11, 13, 14, 16, 25, 30

INTERNATIONAL SEARCH REPORT

Information on patent family members

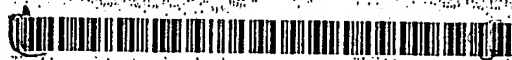
International Application No

PCT/EP 00/09206

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9905878 A	04-02-1999	US 5966657 A	12-10-1999
		AU 8366198 A	16-02-1999
		BR 9810809 A	12-09-2000
		CN 1271500 T	25-10-2000
		DE 19882540 T	21-09-2000
		GB 2344972 A	21-06-2000
		SE 0000166 A	24-03-2000
US 5594949 A	14-01-1997	US 5375123 A	20-12-1994
GB 2327014 A	06-01-1999	AU 8801798 A	25-01-1999
		WO 9902004 A	14-01-1999
EP 0920143 A	02-06-1999	JP 11234765 A	27-08-1999

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
29 March 2001 (29.03.2001)

PCT

(10) International Publication Number
WO 01/22759 A1

(51) International Patent Classification:
H04B 17/00

H04Q 7/38,

(74) Agents: RUUSKANEN, Juha-Pekka et al.; Page White & Farrer, 54 Doughty Street, London WC1N 2LS (GB).

(21) International Application Number: PCT/EP00/09206

(22) International Filing Date:

19 September 2000 (19.09.2000)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

9922217.6

20 September 1999 (20.09.1999)

GB

(71) Applicant (for all designated States except US): NOKIA NETWORKS OY [FI/FI]; Keilalahdentie 4, FIN-02150 Espoo (FI).

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(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

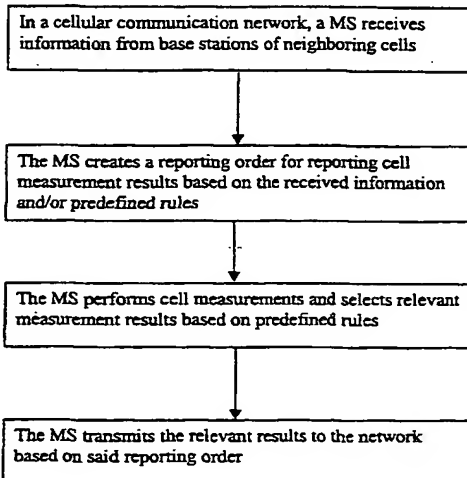
(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:

- With international search report.
- Before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments.

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: REPORTING CELL MEASUREMENT RESULTS IN A CELLULAR COMMUNICATION SYSTEM



(57) Abstract: The present invention relates to reporting cell measurement results associated with a plurality of cells of a cellular communication system. The reporting is transmitted from a station via a radio interface to receiver element of a cell serving the station. The cells are arranged in a reporting order that is to be used by the station for the reporting. The cell measurements are performed by the transceiver station for getting cell measurement results associated with a number of the cells. Relevant cell measurement results are then selected and the selected results are transmitted in the defined reporting order.

WO 01/22759 A1

REPORTING CELL MEASUREMENT RESULTS IN A CELLULAR COMMUNICATION SYSTEM

Field of the Invention

5 The present invention relates to reporting in a cellular communication system, and in particular, but not exclusively, to reporting of measurement results from a transceiver station to the communication system.

10 Background of the Invention

A wireless communication network may comprise a cellular radio network consisting of cells. In most cases a cell can be defined as a certain area covered by one or several base
15 transceiver stations (BTS) serving mobile stations (MS) within the cell via a radio interface. The base station may be connected to a base station subsystem (BSS). Several cells may overlap and cover together a larger area, thereby forming the coverage area of a cellular radio network. The cell (or group
20 of cells) and thus the mobile station (MS) or similar user equipment (UE) within one of the cells of the system can be controlled by a node providing controller functionality. Examples of the network controller include a base station controller (BSC), a radio network controller (RNC) and a
25 mobile switching center (MSC), but other control nodes may also be used. The controller can be connected further to a gateway or linking node, for example a gateway GPRS support node (GGSN) or gateway mobile switching center (GMSC), linking the cell to the other parts of the communication system and/or
30 other communication networks, such as to a PSTN (Public Switched Telecommunications Network) or to a data network, such as to a X.25 based network or to a TCP/IP (Transmission Control Protocol/Internet Protocol) based network. The

cellular telecommunication networks typically operate in accordance with a given standard (or several standards) which sets out what the elements of the network are permitted to do and how that should be achieved. Examples of the cellular telecommunications network standards include code division multiple access (CDMA) based standards (such as the Digital Advanced Mobile Phone Service (DAMPS), or Wide-band CDMA or the proposed Universal Mobile Telecommunications System (UMTS) or time division multiple access (TDMA) based standards (such as GSM: Global Standard for Mobile or the GSM based General Packet Radio Service (GPRS)) or frequency division multiple access (FDMA) based standards. In addition to basic voice and data communication services, the users of the mobile stations are provided with various other services known to the skilled person.

The mobile station and/or the base station may measure and/or define several parameters concerning the conditions in the cell, such as signal levels (power) between the receiving and transmitting stations, quality of the signal, distance between the stations, amount of transmitted data and so on. The mobile station can be provided with appropriate means for defining a value for any parameter that can be measured for the interaction between the mobile station and any of the base stations or the conditions in a cell. The measurements or definitions performed by the mobile station will be referred to in the following as cell measurements and the results obtained by the mobile station will be correspondingly referred to as cell measurement results.

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During an ongoing call the mobile station may report to the network controller so called neighbouring cell measurement results associated with cells neighbouring the cell serving the mobile station at the current moment by a measurement

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result message. In other words, the neighbouring cells can be defined to be the other cells of the system than the cell currently serving the mobile station. For example, in the GSM based systems the reporting may be done on SACCH (Slow
5 Associated Control Channel). In this instance the measurement result message consists of information related to the serving cell and also information concerning the six strongest neighbouring cells. In the GSM based systems the report message frame includes information bits for the measured RX-
10 level (received signal level), BCCH-frequency (Broadcast Control Channel frequency) and the BSIC (Base Station Identity Code) for each reported neighbouring cell. At the current GSM based systems the RX-level is reported with six bits. The value range of the information is set to be from -47 dBm to
15 -10 dBm with 1 dB steps.

In the current measurement reports it is possible to report only six neighbouring cells in maximum. Since the number of the cells with which the mobile station may interact can be
20 greater than this it could be advantageous to have a report covering more than only the six cells. This is especially the case in multisystem or multiband networks and/or in cellular communication systems operating in a multilayer environment. In general, the multimode systems can be defined as a
25 communication environment in which the mobile station may be in a such service area where it may be served by more than one serving network or system or standard or frequency and so on. An example of a multiband system is a dual-band GSM mobile stations served by both 900 MHz and 1800 MHz frequencies. An
30 example of a multisystem is a dual mode telephone operating e.g. in GSM networks and in UMTS networks.

For example, in the current GSM standard a reported neighbouring cell will reserve 17 bits from the reporting message. There is no free space in the current measurement report message to include more cell measurement results for the neighbouring cells than said measurement results for six neighbouring cells.

In addition, the reporting of the RX-level with 6 bits only may cause limitations in the reporting range in some applications. Especially, the maximum value of the indicated RX-level may be insufficient for all applications. Therefore it could be advantageous to be able to indicate RX-levels that are higher than the currently possible levels, such as the -47 dBm maximum value. Reports of higher received signal levels is needed e.g. for the purposes of handover decisions in instances where the mobile station is close to a sectorized base station and moving from one sector to another sector of the base station.

Furthermore, at signal levels above e.g. -47 dBm value, the current measurement report cannot indicate if the serving cell has a higher power than one of the neighbouring cells unless the serving cell is included in a list of the neighbouring cells. This approach is, however, not a desired solution since the number of the real neighbouring cells reported to the network would go down from 6 to 5.

Summary of the Invention

It is an aim of the embodiments of the present invention to address one or several of the above problems.

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According to one aspect of the present invention, there is provided a method in a cellular communication system for reporting cell measurement results associated with cells of the system from a transceiver station via a radio interface
5 between the transceiver station and a cell serving the transceiver station, comprising:

defining a reporting order of the cells to be used by the transceiver station for reporting;

performing cell measurements at the transceiver station
10 for getting cell measurement results associated with at least some of the cells;

selecting relevant cell measurement results from the performed cell measurements; and

reporting the cell measurement results from the
15 transceiver station in the defined reporting order.

According to another aspect of the present invention there is provided a cellular communication system comprising:

a transceiver station;
20 a cell serving the transceiver station via a radio interface;

a plurality of further cells;
wherein the transceiver station comprises control means for performing cell measurements concerning at least some of the
25 further cells, control means for defining a reporting order of the measurement results, control means for selecting relevant cell measurement results from the performed cell measurements, and control means for generating a report message reporting the cell measurement results in the defined reporting order.

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According to another aspect of the present invention there is provided a mobile station for use in a cellular communication system comprising control means for performing cell

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measurements concerning cells of the system, control means for defining a reporting order of the measurement results, control means for selecting relevant cell measurement results from the performed cell measurements, and control means for generating
5 a report message reporting the cell measurement results in the defined reporting order.

According to another aspect of the present invention there is provided a network node of a cellular communication system
10 comprising means for receiving cell measurement results from a station communicating with one of the cells of the system, said measurement results being associated with a plurality of cells of the communication system and being reported from the station in a reporting order of the cells defined by the
15 station, control means for defining the reporting order used by the station for the reporting and control means for attaching measurement results to cells based on the reporting order.

20 According to more specific embodiments, the measurement results are reported by information symbol strings containing a plurality of information symbols, wherein an indication symbol is included into the measurement report string for indicating whether the following predefined number of symbols
25 in the string includes the cell measurement results of a subsequent cell in the reporting order of the cells or whether the subsequent cell will not be reported in the measurement report string. In addition, predefined information about the cells to the measured may be received at the mobile station,
30 wherein the definition of the reporting order is based on said received information. The reported measurement results may be associated with respective cells at a control node of the cellular communication system.

The embodiments of the invention provide several advantages. By means of some of the embodiments it is possible to include cell measurement reports for a greater number of cells within a reporting message without increasing the length of the reporting message string. Some of the embodiments enable use of a greater number of information symbols for each of the reported cells without increasing the length of the reporting message or reducing the number of the cells reported by a single message. By means of this it is possible to increase the range of the reported measurements. In addition, in some embodiments it is not necessary to transmit an identification of the cell, such as information of the frequency of the broadcast channel and the base station identity, for each of the measured cells together with the results from the mobile station.

Brief Description of Drawings

For better understanding of the present invention, reference will now be made by way of example to the accompanying drawings in which:

Figure 1 shows a cellular radio system with which the embodiments of the present invention can be used;

Figure 2 is a schematic presentation of a mobile station constructed in accordance with the present invention;

Figure 3 is a flowchart illustrating the operation of one embodiment of the present invention; and

Figure 4 illustrates one example of coding of a report message in accordance with one embodiment of the present invention.

Description of Preferred Embodiments of the Invention

Reference is made to Figure 1 which shows a cellular system with which the embodiments of the present invention can be used. It is noted that even though the exemplifying telecommunications network shown and described in more detail in the following uses the terminology of a circuit switched GSM (Global System for Mobile communications) public land mobile network (PLMN), the proposed solution may be used in any cellular communication system. It should also be appreciated that the embodiments of the invention may be implemented using any number of cells. The radio coverage area of a cell may consist, for example, of a relatively omnidirectional pattern or a sector of a base station may be provided with a directional or sector antenna (not shown). The sector base station may use e.g. three 120° directional antennas whereby three radio coverage areas are provided, or four 90° directional antennas providing four radio coverage areas and so on, or any combinations of different radio coverage beam widths. It should also be appreciated that base stations may sometimes be referred to as node B (e.g. in the UMTS standard).

Figure 1 illustrates two layers or cells 1 and 2, respectively. The arrangement may be, for example, such that the first layer of cells 1 belongs to a network based on a first standard and the second layer of cells 2 belongs to a network based on a second standard. Each of two each cell 1,2 is served by the respective base transceiver station BTS. Each base transceiver station BTS is arranged to transmit signals to and receive signals from the mobile station MS 7 in the cell. Likewise, the mobile station is able to transmit signals to and receive signals from the respective base transceiver station. The mobile station 7 accomplishes this via wireless

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or radio communication with the base stations. Typically a number of mobile stations will be in communication with each base station although only one mobile station is shown in Figure 1 for clarity.

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Each of the base stations is connected to a network controller, which in one form of the exemplifying GSM system comprises a base station controller (BSC) 8 connected further to a Mobile Switching Center (MSC) 9. In the described embodiment the BSC is providing the network controller functionality for the purposes of the described embodiments. However, it is noted that the base station controller 8 controlling one or several base stations between the network controller and the base stations may be omitted in some embodiments. Therefore any other appropriate network element may be used for providing a controller functionality than can be used for processing measurement information from the mobile station 7. It is also noted that typically more than one network controller is provided in a network. The network controller is connected to other elements or parts of the telecommunications network system via a suitable linking or gateway apparatus, such as Gateway Mobile Switching Center (GMSC; not shown).

25 The implementation of the communication between the mobile station, the base station and the controller is known, and will thus not be discussed in more detail herein. It is sufficient to note that the interface may comprise channels in both uplink and downlink directions between the mobile station
30 in the cell associated with a given base station and that the information sent to the mobile station and the data may be sent in any suitable format. The messages sent from the mobile stations may include information identifying the mobile

station (for instance, MS ID and/or IMSI (Mobile Station Identity and/or International Mobile Subscriber Identity, respectively)).

- 5 As disclosed by Figure 1, the mobile station can be simultaneously in the signaling area of several cells. The mobile station is arranged to perform measurements, for example in order to be able to provide information based on which a suitable cell can be selected for serving the mobile
- 10 station. In other words, in addition to controlling the ongoing connection with the servicing base station, the mobile station may perform measurements concerning the other cells as well.
- 15 It should be appreciated that this description uses the term neighbouring cell for defining any further cell that can be reached by a mobile station in a cell of the cellular communication system. That is, the cells need not to have any "border line" therebetween but the neighbouring cells or other
- 20 cells may be partially overlapping, or even covering the entire coverage area of the servicing cell. In addition, the neighbouring cells may be cells of another type of communication network (e.g. networks based on different standards) or cells of a system using another frequency. The
- 25 latter is the case when, for example, so called dual-band mobile stations are used.

Figure 3 illustrates a flow chart for an embodiment for transmitting report messages from the mobile station. In the

30 embodiment only such measurement results that associate to relevant neighbouring cells are reported to the network controller. According to a preferred embodiment this is accomplished without including any identification parameters

of the related neighbour cells. The measurement results, such as RX-levels, are reported in a specific order of which the appropriate network controller, such as the BSC or RNC, is also made aware of.

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Since the controller is aware of the reporting order, it is possible for it to conclude to which neighbouring cells the reported measurement results relate. Appropriate control or processing means 6 of the controller 8 of Figure 1 for accomplishing this are known, and will thus not be explained in more detail. It is sufficient to note that the controller nose is arranged to receive the cell measurement results from the mobile station 7 and to define measurement result and cell pairs based on the reporting order such that a respective measurement results is associated with a respective cell.

According to one possibility the reporting order is defined in the protocols and/or standards used by the cellular communication system. According to another approach the mobile station provides the controller with information of the reporting rules for setting the cells in an order the mobile station is going to use when reporting the cell measurement results, e.g. the RX-levels of the respective base stations to the network. According to a further possibility the controller provides the mobile station with instructions concerning the reporting order to be used when reporting the cell measurement results. The mobile station may also receive an elsewhere prepared reporting order, and thereafter use the received order as such for the reporting. In this case the definition processing done by the mobile station is for defining that the received reporting order is to be used for the reporting. It is noted that the rules for setting the cells in order may be changed during the operation of the communication system. The

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change may be dynamic, e.g. the change may occur as response to a predefined event (e.g. a system failure, overload, peak hour conditions, night time conditions, and so on) detected or defined by the system.

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This explicit reporting order of the neighbouring cells may be defined by the mobile station based on neighbouring cell BCCH (Broadcast Control Channel) frequencies (e.g. based on ARFCN: Absolute Radio Frequency Channel Number) and the BSICs (Base Transceiver Station Identity Code) of the neighbouring cells received at the mobile station from the network. As mentioned above, the appropriate controller in the radio network side is also aware of this reporting order of the cells. The mobile station proceeds the cell measurements and selects relevant neighbouring cell measurement results among the performed measurements. These selected relevant results are then transmitted to the network in the known reporting order. The controller defined based on the known reporting order those cells the respective reported results relate.

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The selection of the relevant cells may be based on any appropriate predefined rule of selection. The rules may be defined in the standards the mobile station and/or the communication system is arranged to use. The rules may be stored permanently in the mobile station. According to one possibility the rules are stored in an appropriate network element and transmitted therefrom to the mobile station when ever required. As was the case with the rules for setting the cell in a predefined order, the rules for selecting relevant cells may also be changed when this is deemed necessary. The selection of the relevant cells may be based, with no limitation to the following, on the measured signaling levels, used radio frequencies, direction of the movement of the

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mobile station, loading conditions of the neighbouring cells and so on.

Figure 2 illustrates schematically a sectioned mobile station 7 which may be used in the embodiments of the invention. The mobile transceiver station comprises an antenna 20 for receiving and transmitting radio signals. The mobile station 7 comprises further control means 22 for performing various cell measurements associated with several base stations. In addition, control means 24 are provided for generating the reporting order of the measurement results. Control means 26 are provided for selecting the relevant ones of the performed cell measurements results. Control means 28 are provided for generating a report message reporting the relevant cell measurement results in the generated reporting order via the radio interface with the serving base station. It should be appreciated that the functions of the controllers 22 to 28 can be implemented by a single controller, or by two or three controllers or that said functions can be distributed to more than the four control units 22 to 28 of the mobile station 7.

A preferred embodiment for the transmission of the measurement results will now be described with reference to Figure 4, wherein specific indication bits are used in the report messages transmitted from the mobile station to the network. More precisely, an indication bit can be used for each neighbouring cell measurement result indicating whether the following bit is a first bit of a relevant measurement result for a cell or a bit indicating a next neighbouring cell in the predefined reporting order. The latter may be the case e.g. when no measurement information is available for the preceding neighbouring cell and therefore the cell does not have any relevancy for the operation of the mobile station. However,

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the division between the relevant and non-relevant cells may be based in any other criteria as well. The bit indicating a non-relevant cell can be referred to as a skip bit.

- 5 From Figure 4 it can be seen that the measured RX-level is reported for the cells which are in the reporting order list on places 1 to 5, 24 to 29 and 32. No cell measurement result information is reported for the neighbouring cells being in the places 6 to 24 and 30 to 31 in the reporting order.

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- According to one possibility, the order of the bits for measurement results and the indication bits is such that the first bits of the measurement report string indicate only what cells are reported. The following bits will then include the information of the results. E.g. in the exemplifying system of enabling 32 neighbouring cell, the first 32 bit may be arranged such that the "1" indicates that the cell is reported. "0" would then indicate that the cell is not reported. After the first 32 bits, the following information bits or other information symbols in the string inform in the reporting order the results for those cells that were indicated by "1".

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- Since the cells to which the cell measurement results relate can be identified by the reporting order used in the measurement report, no additional bits are required for the cell identification. Therefore more neighbouring cells can be added to the measurement report. For example, if the number of bits reserved for a cell to be reported is seven bits, this is ten bits less than the number of bits reserved by the current solution in the GSM for reporting one neighbour cell.

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As the non-relevant neighbouring cells are also included in the reporting order of the measurement results, the non-relevant cells have to be indicated in the measurement report. However, the number of bits reserved for a non-relevant neighbouring cell (i.e. not reported cell) may be only one bit, as will be explained later on in this specification.

According to a more specific example of the embodiment, the network may transmit the neighbouring cell BCCH frequencies (e.g. the ARFCN values) in System Information 5 (SI 5), System Information 5bis and System Information 5ter messages based on GSM Specification 04.18 version 8.0.0. The BSICs of the neighbouring cells are transmitted to the mobile station in a message indicating the identity of the transmitting station. This may be a new message or then a message encapsulated to another message which the mobile station may receive. According to one option the identity indication message replaces the SI 5 messages and contains both the BCCH frequencies as well as the BSICs.

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According to an embodiment the mobile station sets all the neighbouring cells in an explicit reporting order based on the above described two parameters. The reporting order is also known by the network. It is noted that each BCCH frequency may have more than one associated BSIC. After the above information has been received, each of the neighbouring cells can be identified with a unique BSIC/BCCH ARFCN pair and the neighbouring cells can be put into an explicit order according to the data in the relevant system information messages.

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The total number of neighbouring cells can be limited to correspond the mobile station measurement capabilities. According to an embodiment the number of cells is 32, which is

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the maximum number of neighbouring cells at the current network architectures. However, this is only an example, and the number of neighbouring cells can be smaller or greater than 32.

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In the measurement report the RX-levels of the relevant neighbouring cells are reported using this specific order. The measurement report includes an indication bit for each neighbouring cell. By the indication bit it may be indicated whether the following bits (for example, the following 6 bits) describe the RX-level of that specific neighbouring cell or not. For example, the arrangement may be such that an indication bit value "1" means that the RX-level is included and an indication bit value "0" means that no RX-level is not included for the given cell. If no RX-level is available the bit followed the current indication bit will then be the indication bit for the next neighbouring cell in the reporting order.

20 The embodiments of the invention enable an arrangement where it is not necessary to associate a BSIC and an index to each individual measurement result, thereby saving a lot of space in the report message. The BSIC is not required since the BSIC/BCCH frequency information is transmitted to the mobile station and the mobile station may decide which measurements are valid i.e. relevant and such which need to be reported. In the current systems this is done at the base station controller. The index is not required and can thus be removed from the report. The mapping of the RX-level or any other measurement result to the corresponding cell is based on the order of the results instead of any indexes.

Since the embodiment makes it possible with to leave the BSIC and BCCH-frequency of each neighbour cell out from the measurement report message and thereby enables inclusion of measurement results (e.g. the received signal level) of a greater number of neighbour cells. The report includes only the RX-level of the reported neighbour cells and the indication bit, and no other parameters are required to identify the cells in the report message. In the GSM example described above this means that since 107 bits reserved for neighbour cell measurement results can be used so that only seven bits are used for a cell with measurement result and one bit is used for a cell without any (or with a non-relevant) measurement result. For example, all cells can be reported in a cell having 32 neighbours such that the report includes measurement results for seven neighbouring cells ($12 \times 7 + 20 \times 1 = 104$ bits). This leaves even 3 bits free for other reporting purposes.

According to a measurement report message that is based on the GSM standards, there can be 13 octets and 3 additional bits available for neighbouring cell reporting, thereby providing $8 \times 13 + 3 = 107$ bits long reporting string or frame. At the current systems one cell can have a maximum of 32 neighbouring cells. The RX-level reporting reserves seven bits for a relevant neighbouring cell and one bit for a non-relevant neighbouring cell. In the case all neighbouring cells can be measured, the 15 first neighbouring cells on the list can be reported. If no limitations is set to the placing of the cells in the reporting order list, the maximum number of cells would be 12. In this instance the number of the reported neighbouring cells can be doubled from the above by means of the embodiments of the present invention.

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The reported signal levels may be indicated with relation to a certain predefined reference signal level. The reference signal level may be transmitted in the same measurement report message. The reference signal level is preferably set so that
5 each of the relevant signal levels can be reported by means of the reference level. More precisely, a reference level for the signal level is transmitted e.g. with three bits, with 4 dB steps (for example, 0= -110 dBm, 1=-106 dBm, 2=-102 dBm). Each measured signal level from the serving cell and from the
10 relevant neighbouring cells are then indicated in the report in relation to this reference signal level. The reference signal level may be chosen so that each reported signal level is explicitly stronger or weaker than the reference signal level.

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The following is presented in order to further clarify the scaling of the frame. The reference signal level may be indicated with three bits, thereby offering eight different values. Six bits are reserved for the indication of the
20 relation between the measured result and the reference value. This makes it possible to have up to 63 dB dynamics in the signal level reporting. If the difference from the reference level is indicated with five bits, then dynamic would be up to 31 dB, which may also be sufficient for several applications.
25 The five bit indication would save one further bit per reported neighbouring cell when compared to the received signal level reporting used in some of the current cellular systems.

30 Using reference level and indicating the difference from this reference level it is possible to widen the reporting range from -48 dBm to stronger signal levels. The stronger (i.e

higher or greater) signal levels are levels > -48 dBm, such as -47 dBm, -40 dBm or -30 dBm.

The enhanced cell measurement reporting discussed above can be readily supported by "new" mobiles stations comprising the required control hardware and/or software, as illustrated by Figure 2. It is, however, preferred that the embodiments are used under control of an appropriate network element or elements. This guarantees compatibility between the "new" mobiles stations supporting the embodiments of the invention and "old" network implementations that cannot handle the described new reporting mode. If the neighbouring cell frequencies are sent with current system information messages while the BSIC information is sent in separate messages, the mobile station may send measurement reports with the "old" report after a handover until the mobile station is ordered to use the new report mode, e.g. as a result of receiving the message indicating the BSICs. By means of this it is possible to minimize the gap in neighbouring cell reporting after a handover, since the information of neighbouring cell frequencies can be received before the full information required for the new reporting format. The old reporting format needs to be used until it is known that the new cell supports the new reporting format. Alternatively the reporting mode after the handover is controlled by a corresponding new indicator in the handover command.

It should be appreciated that whilst embodiments of the present invention have been described in relation to mobile stations, embodiments of the present invention are applicable to any other suitable type of user equipment. In addition, while a message containing information bits and an indication

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bit are discussed above, the embodiments may be implemented by using any appropriate information symbols.

5 It is also noted herein that while the above describes exemplifying embodiments of the invention, there are several variations and modifications which may be made to the disclosed solution without departing from the scope of the present invention as defined in the appended claims.

Claims

1. A method in a cellular communication system for reporting cell measurement results associated with cells of the system
5 from a transceiver station via a radio interface between the transceiver station and a cell serving the transceiver station, comprising:

defining a reporting order of the cells to be used by the transceiver station for reporting;

10 performing cell measurements at the transceiver station for getting cell measurement results associated with at least some of the cells;

selecting relevant cell measurement results from the performed cell measurements; and

15 reporting the cell measurement results from the transceiver station in the defined reporting order.

2. A method according to claim 1, wherein the measurement results are reported by information symbol strings containing
20 a plurality of information symbols, the method further comprising a step of including an indication symbol into the measurement report string for indicating whether the following predefined number of symbols in the string includes the cell measurement results of a subsequent cell in the reporting
25 order of the cells or whether the subsequent cell will not be reported in the measurement report string.

3. A method according to claim 2, wherein, in the event that the cell measurement indication symbol indicates that it will
30 not be followed by symbols reporting the measurement results, the following symbol included in the measurement report string is a further indication symbol designated for a cell following the subsequent cell in the reporting order of the cells.

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4. A method according to any of the preceding claims,
comprising further steps of receiving predefined information
about the cells to be measured at the mobile station, and
5 defining the reporting order based on said received
information.
5. A method according to claim 4, wherein said information
comprises frequency of a broadcasting control channel and the
10 identity of a transmitting base station of the cell to be
measured.
6. A method according to claim 4 or 5, wherein at least
part of the information is transmitted in a separate message
15 via the broadcasting control channel.
7. A method according to any of the preceding claims,
further comprising a step of associating each of the reported
measurement results with respective cells at a control node of
20 the cellular communication system.
8. A method according to any of the preceding claims,
wherein the reported cell measurement result for a cell
comprises signal level of a radio signal received at the
25 transceiver station.
9. A method according to any of the preceding claims,
wherein the reporting order is defined and the cell
measurements are performed at the transceiver station for
30 cells other than the serving cell.

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10. A method according to any of the preceding claims, wherein the reporting order is based on the information received from the serving cell.
- 5 11. A method according to any of the preceding claims, wherein rules for defining the reporting order are stored at the transceiver station.
- 10 12. A method according to any of the preceding claims, comprising a step of transmitting rules for the reporting order to the transceiver station via the radio interface.
- 15 13. A method according to any of the preceding claims, comprising a step of changing rules for defining the reporting order.
- 20 14. A method according to any of the preceding claims, wherein rules for selecting the relevant other cells are stored at the transceiver station.
- 25 15. A method according to any of the preceding claims, comprising a step of transmitting rules for the selection of relevant cells to the transceiver station via the radio interface.
- 30 16. A method according to any of the preceding claims, comprising a step of changing the rules for the selection of the relevant cells.
17. A method according to any of the preceding claims, wherein the transceiver station sends the communication system information of the rules used for generating the cell measurement report.

18. A method according to any of the preceding claims, wherein the reported information of the cell measurement results is based on reference values.

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19. A method according to claim 18 in conjunction with claim 8, wherein the reported information indicates if the measured signal level is stronger or weaker than the reference value.

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20. A cellular communication system comprising:

a transceiver station;

a cell serving the transceiver station via a radio interface;

a plurality of further cells;

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wherein the transceiver station comprises control means for performing cell measurements concerning at least some of the further cells, control means for defining a reporting order of the measurement results, control means for selecting relevant cell measurement results from the performed cell measurements, and control means for generating a report message reporting the cell measurement results in the defined reporting order.

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21. A cellular communication system according to claim 20, comprising at least two different cellular network

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arrangements.

22. A cellular communication system according to claim 20 or 21, wherein the report message contains information symbols and at least one indication symbol in a string, said indication symbol indicating whether the following predefined number of symbols in the string define the cell measurement results of a subsequent cell in the reporting order of the

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cells or whether the subsequent cell will not be reported in the string.

23. A cellular communication system according to claim 22,
5 wherein, in the event that the cell measurement indication symbol is for indicating that it will not be followed by symbols reporting the measurement results, the following symbol in the measurement report string is a further indication symbol designated for a cell following the
10 subsequent cell in the reporting order of the cells.

24. A cellular communication system according to any of the claims 20 to 23, wherein the transceiver station is arranged to receive predefined information associated with at least
15 some of the further cells for use in defining the reporting order of the further cells.

25. A cellular communication system according to claim 24, wherein the information comprises the frequency of a
20 broadcasting control channel and the identity of a transmitting base station of the cell to be measured.

26. A cellular communication system according to any of the claims 20 to 25, further comprising a control node including
25 means for associating measurement results with corresponding cells based on the reporting order.

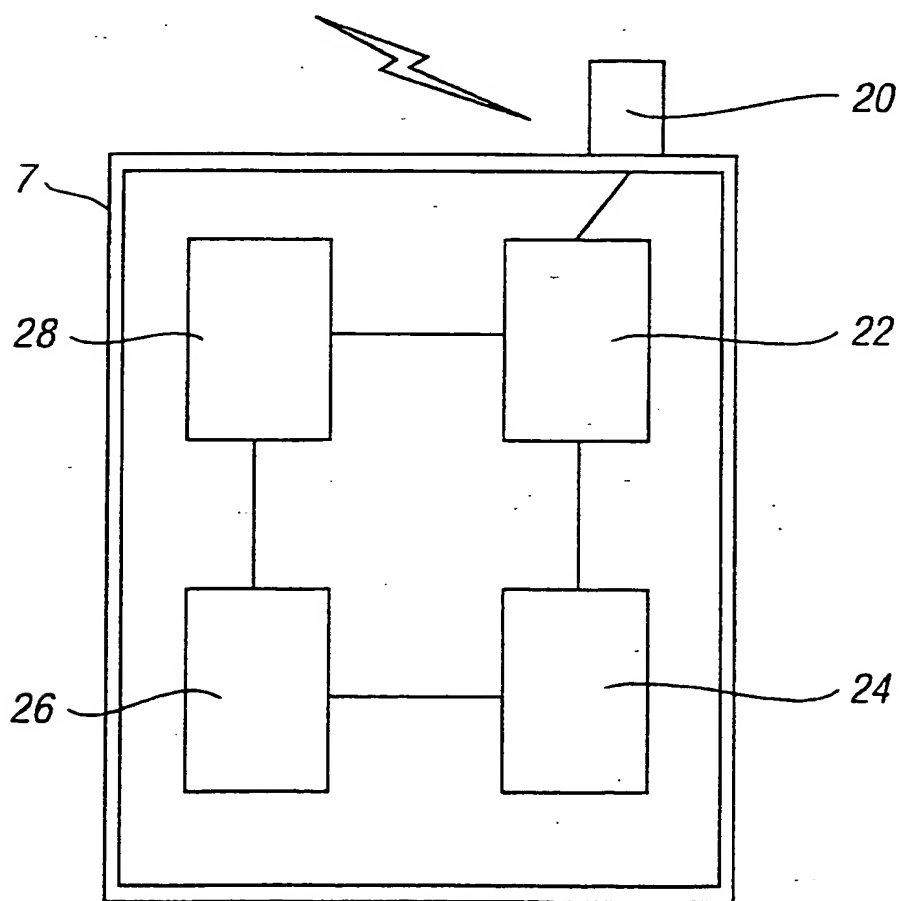
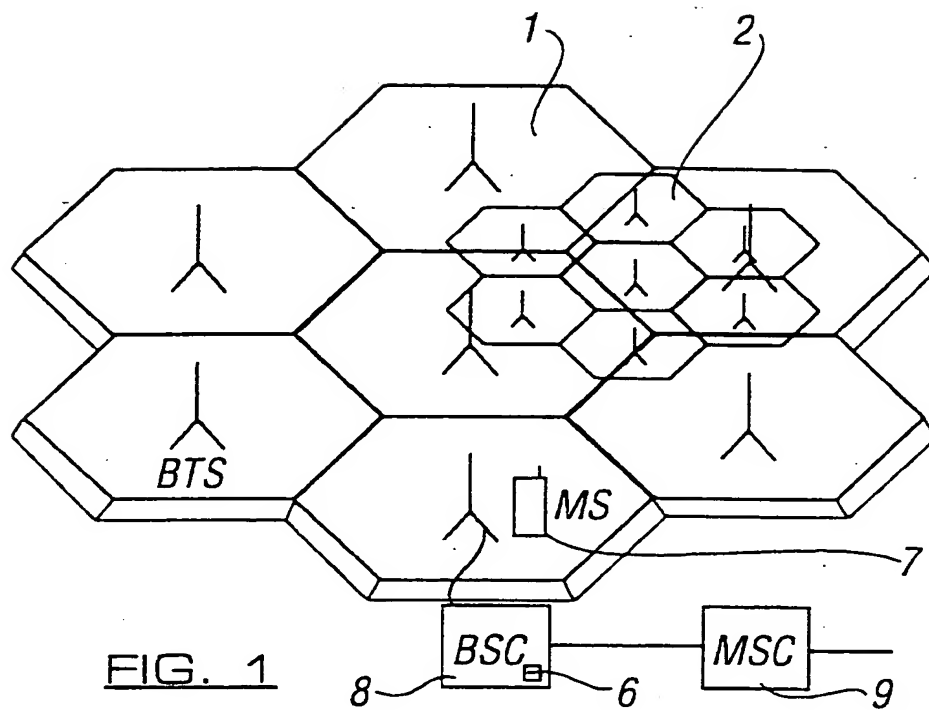
27. A mobile station for use in a cellular communication system comprising control means for performing cell
30 measurements concerning cells of the system, control means for defining a reporting order of the measurement results, control means for selecting relevant cell measurement results from the performed cell measurements, and control means for generating

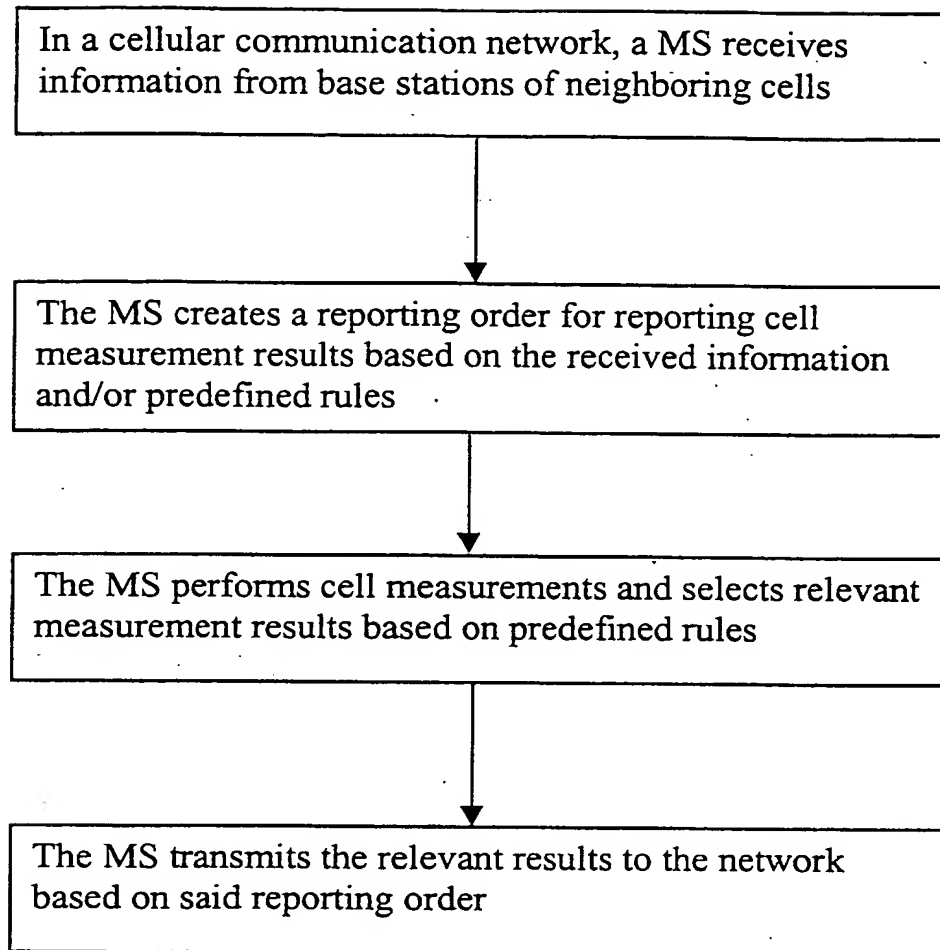
a report message reporting the cell measurement results in the defined reporting order.

28. A mobile station according to claim 27, said mobile
5 station being arranged to operate in at least two different cellular network systems.

29. A mobile station according to claim 27 or 28 being
further arranged to receive predefined information associated
10 with at least some of the further cells for use in defining the reporting order of the further cells.

30. A network node of a cellular communication system
comprising means for receiving cell measurement results from a
15 station communicating with one of the cells of the system, said measurement results being associated with a plurality of cells of the communication system and being reported from the station in a reporting order of the cells defined by the station, control means for defining the reporting order used
20 by the station for the reporting and control means for attaching measurement results to cells based on the reporting order.



FIG. 3

8	7	6	5	4	3	2	1	Octet 1
Measurement Results 2 IEI								Octet 2
Serving cell and other measurement results (Not relevant)								Octet 3
								Octet 4
IND=1	RXLEV-NCELL 1						IND=1	Octet 5
RXLEV-NCELL 2 (low part)						IND=1	RXLEV-NCELL 3 (high part)	Octet 6
RXLEV-NCELL 3 (low part)				IND=1	RXLEV-NCELL 4 (high part)		Octet 7	
RXLEV-NCELL 4 (low part)				IND=1	RXLEV-NCELL 5 (high part)		Octet 8	
RXLEV-NCELL 5 (low part)		IND=0	IND=0	IND=0	IND=0	IND=0	Octet 9	
IND=0	IND=0	IND=0	IND=0	IND=0	IND=0	IND=0	Octet 10	
IND=0	IND=0	IND=0	IND=0	IND=0	IND=1	RXLEV-NCELL 24 (high part)	Octet 11	
RXLEV-NCELL 24 (low part)				IND=1	RXLEV-NCELL 25 (high part)		Octet 12	
RXLEV-NCELL 25 (low part)			IND=1	RXLEV-NCELL 26 (high part)			Octet 13	
RXLEV-NCELL 26 (low part)			IND=1	RXLEV-NCELL 27 (high part)			Octet 14	
RXLEV-NCELL 27 (low part)	IND=1	RXLEV-NCELL 28						Octet 15
IND=1	RXLEV-NCELL 29						IND=0	Octet 16
IND=0	IND=1	RXLEV-NCELL 32						Octet 17

FIG. 4

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 00/09206

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04Q7/38 H04B17/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04Q H04B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	<p>WO 99 05878 A (ERICSSON TELEFON AB L M) 4 February 1999 (1999-02-04)</p> <p>abstract; figures 5,6 page 4, line 21 -page 6, last line page 7, line 9 -page 8, line 24 page 13, line 10 - last line page 16, line 9 - line 15 page 18, line 28 -page 20, line 24</p> <p style="text-align: center;">--- -/--</p>	<p>1,4,5, 7-11,13, 14,16, 17,20, 24-27,29 2,3,6, 12, 21-23, 28,30</p>

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

20 December 2000

Date of mailing of the international search report

25/01/2001

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 00/09206

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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X A	GB 2 327 014 A (ERICSSON TELEFON AB L M) 6 January 1999 (1999-01-06) page 2, line 20 - line 22 page 5, line 20 - last line; figure 1 page 6, line 17 - line 22 page 6, line 31 -page 7, line 13 page 8, line 7 -page 9, line 10; figure 3 claim 1 -----	1,4, 7-10,20, 24,26, 27,29 5,6, 12-14, 16,25,30
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 00/09206

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